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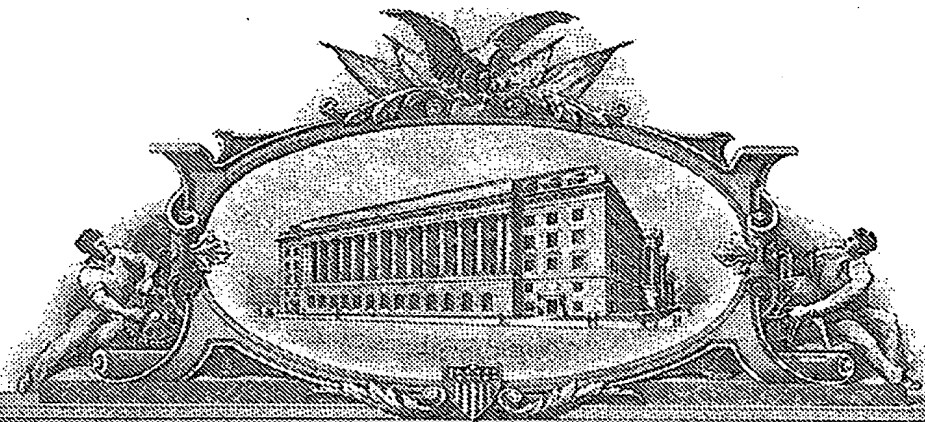
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22264 U.S. PTO
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INVENTOR(S)					
Given Name (first and middle (if any))		Family Name or Surname		Residence (City and either State or Foreign Country)	
Mike		Pavlov		Bloomington, New York	
<input checked="" type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto					
TITLE OF THE INVENTION (280 characters max)					
RAPID DEPLOYMENT BARBED TAPE AND DISPENSER					
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ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification Number of Pages 11		<input type="checkbox"/> CD(s), Number 			
<input checked="" type="checkbox"/> Drawing(s) Number of Sheets 15		<input type="checkbox"/> Other (specify) 			
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76					
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<input checked="" type="checkbox"/> No.					
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Respectfully submitted,

SIGNATURE

TYPED or PRINTED NAME

David E. Allred

TELEPHONE

480-655-0073

Date

07/19/04

REGISTRATION NO.

47,254

(if appropriate)

Docket Number:

COBR-10382

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Title: RAPID DEPLOYMENT BARBED TAPE AND DISPENSER

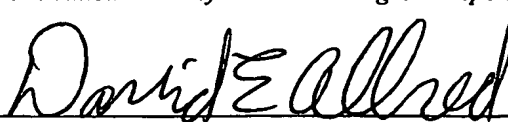
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**APPLICATION FOR
UNITED STATES LETTERS PATENT**

**RAPID DEPLOYMENT BARBED TAPE
AND DISPENSER**

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RAPID DEPLOYMENT BARBED TAPE AND DISPENSER

DISCLOSURE OF THE INVENTION

The present invention relates generally to barbed tape products and in particular to rapid deploy barbed tape products and dispensers for deploying and taking up the barbed tape product. A barbed tape product that can be easily deployed on the ground by offloading it from a dispenser on a trailer or the like while a towing vehicle pulls the trailer along the course of deployment has great advantages of quickly forming a barrier that can be temporary. The barbed tape product can be easily taken back up onto the dispenser for redeployment elsewhere. The product has internal and/or external trusses to inhibit deformation and/or rolling away of the product.

The foregoing and other features and advantages of the present invention will be apparent from the following more detailed description of the particular embodiments of the invention, as illustrated in the accompanying drawings.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

Figure 1 is an exemplary view of a system for making barbed tape product. As discussed above, embodiments of the present invention relate to a system and methods of forming a barbed tape product, and are directed more particularly to the product formed by the system and methods. For example, Figure 1 is a diagrammatic view of a machine or system of machines 30 for forming a barbed tape product in accordance with the present invention. As such, the system includes a spool 35 of tape 39 in the form a thin flat tape stock material. The spool 35 may be automatically turned by a motor 42. The tape 39 is guided through a shock

absorbing portion of the system that includes guide rollers 43, 44, and 46. Then a feed device 50 moves the tape 39 into a blanking press 60. The blanking press 60 forms barbs on the tape 39. Thus, a barbed tape 63 is guided by idlers 72, 74, and 76 into a forming station 75 from a reel 79. In the forming station 75, a roll former 80 forms the barbed tape 63 at least partially around the wire 78 to form an integral barbed tape product. The barbed tape product is moved forward through the system into a radial bender 90. The radial bender 90 provides a continuous bend into the barbed tape product so that the barbed tape product is biased into coils. The coils are subsequently wound into rolls corresponding generally to the size of the coils for further processing, storage, shipping, and dispensing. Hence, as the barbed tape product leaves the radial bender 90 and the forming station 75, it does so as a radially bent single strand of barbed tape product 95.

This strand of barbed tape product 95 is received on a take up reel 99. The take up reel 99 may have a motorized product pulling paddle 102 for moving the strand of product 95 circumferentially around the take up reel 99. A clip gun 105 and an anvil 108 are disposed on radially opposite sides of product strands 95 on the take up reel 99. A string of interconnected clips 111 are fed into the clip gun 105 by a clip slip 114. The clip gun 105 is pneumatically, hydraulically, or otherwise powered to automatically and repeatedly clip adjacent strands 95 together in a predetermined pattern as will be described in greater detail below.

Advantageously, an electronic controller 117 is integrated with the system 30. The electronic controller 117 may be preprogrammed via a programming device 120. The programming device 120 may remain connected to the electronic controller or may be removed once the electronic controller 117 has been programmed. As shown in Figure 1, the electronic controller is operatively connected to the various portions or machines within the system 30 in order to synchronize the operation of the various portions with each other. For example, the electronic controller may be operatively connected with the stock tape reel motor 42, the feed device 50, the blanking press 60, the forming station 75, the motorized paddle 102 of the take up reel 99, and the automatic clipping gun 105. Thus the system 30 can automatically form, coil, and attach adjacent loops of the product strand 95 under the control of the electronic

controller 117. Systems of the type shown in Figure 1, portions of the system, or combinations of a plurality of system can be implemented to form any of a variety of barbed tape products.

Figure 2A is a diagrammatic view of the take up reel 99 with a variety of devices that may be supported thereon for attaching objects to the barbed tape product of the present invention. Element 105 represents the clipping device 105 shown in Figure 1 and described above. Element 102 represents the motorized paddle 102 or index paddle described above. The take up reel 99 may further have rollers 221 for aiding smooth rotation of the reel 99. A line attaching device 224 may be provided for attaching a line to the product at predetermined positions under software control. The line attaching device may attach a spacer line 227 to limit separation of selected ones of the loops from each other in the deployed state. A plurality of line attaching devices may be supported on the take up reel 99 at predetermined circumferential positions around the coil of the product to form a generally uniform separation of loops of the strand on all sides of the coil when it is deployed. Alternatively, different spacing lengths of the spacer line 227 may be provided at different positions on the coil to provide a predetermined configuration of the coil in its deployed state.

Other devices may be selectively provided on the take up reel including a sensor line attaching device 230 that may be supported at a generally radially inward position on the reel for attaching a sensor or other line 233 generally on an inside of the product strand. The other line 233 or the spacer line 227 may be one of a plurality of such lines that may include, but are not limited to, spacer lines, trip lines, and/or sensor lines. It is to be understood that the sensor lines may be of any type, including but not limited to magnetic or fiber optic lines. All of these lines may incorporate any suitable material including, but not limited to, metals, plastics, or composites formed as wires, tapes, ribbons, cables, or ropes, for example. The reel 99 may also have a tab inserting device 236 supported thereon for attaching tabs or flags to the strand of product at predetermined positions.

As described above with regard to the attachment points and attachment elements 111, the spacer lines, trip lines, sensor lines, and tabs may be attached at any predetermined positions on the product strand. Furthermore, it is to be understood that these positions may be

varied within a roll or unit 373, 385 of the product, or may be varied from one roll to another. As shown, a cut off device 239 may be provided separately from the attaching device for cutting the product at a predetermined position. Alternatively, the cut off device may be provided integrally with the attaching device 105. Furthermore, it is to be understood that one or more of the line attaching devices 224, 230 could be provided integrally with the attaching device 105. In fact, any number of the attaching device 105 and the other devices may be integrated together as attachment mechanisms of an overall device or may be provided separately without departing from the spirit and scope of the invention. It is also to be understood that any number of additional devices such as auxiliary device 240 may be provided on the take up reel to treat the strands of product or attach additional objects in any manner desired to provide a variety of functions to the product. For example, motion sensors or microphones could be attached to the product at selected locations.

Figure 2B is a perspective view of a segment of barbed tape product 242 having an exemplary spacer line 227 attached to an exterior of the coil by line attachment elements 245. These line attachment elements 245 may be the same as the attachment elements 111 described above and in greater detail below, or they may be attachment elements configured specifically for attaching lines. The attachment elements 111, 245 may function to both attach adjacent loops of the product together and to attach separate objects, including the spacer lines 227. Figure 2B shows the sensor line 233 held on an interior of the coil by attachment elements 248. As may be appreciated, the spacer lines 227 and the other lines 233 may function as trip lines because they will cause the product to close in upon any intruder that engages the lines 227, 233. While shown in a relatively loose relation similar to hog rings in Figure 2B, the attachment elements 245, 248 may form a tight crimp on the product 242 in order to hold the lines or other objects to the strand of product at the predetermined positions. Furthermore, the lines 227, 230 may be fastened by other mechanisms including by structural elements integral with the lines 227, 230 themselves, for example. Still further, the line attaching devices 224, 230 may take a form other than that of clipping guns. Axially adjacent attachment elements among each of elements 245 and 248 may be circumferentially offset relative to each other to facilitate

automatic attachment under control of the electronic controller. It is to be understood that Figure 2B is exemplary only. It is expected that two to four spacer lines may also be attached to the product for holding the product in a uniformly distributed position in the deployed state. Also, tabs or flags 251 may be attached to the product at predetermined intervals or selected positions.

The attachment of objects including spacer lines 227, 233 shown and described with regard to Figures 2A and 2B may be applied to concertina products as well as to non-concertina products. A method of making a barbed tape concertina product, for example, may include attaching the spacer line at a position of every fifth clip. That is, the electronic controller could be configured to attach the spacer line 227 and then skip four clips and attach the spacer line 227 at the fifth clip. Alternatively, the product may be a non-concertina product and have the same spacing configuration. That is, with attachments at positions where every fifth clip would normally have been in a concertina product. (These attachments may be generally in a line in the axial direction.) Such an arrangement has great material saving advantages while providing uniform spacing of the loops during deployment.

Furthermore, the non-concertina product formed with spacer lines 227 has the advantage of enabling a method of deploying that is very fast and simple. This method entails fixing a first end of a roll on the ground or other structure to be protected. Then a truck or other vehicle carrying the rest of the roll may be driven along a path in which the product 242 is to be deployed. A slight tension may be applied to the roll so that the product pays out at the same rate the vehicle moves away from the first end of the product until the roll is completely expanded into its deployed state. Multiple rolls may be connected together and payed out in this manner. The rolls of the non-concertina product formed in the manner described above have a helical configuration, even in the expanded deployed state. Therefore, collection of the product may be advantageously accomplished by an auger that turns and pulls the product into a collection bin. As may be appreciated, such an auger provides great collection advantages since the product is otherwise difficult to handle and especially difficult to collect. Automation

of such an auger has additional advantages of increased speed and power in collecting the
barbed tape product 242.

In accordance with the attachment capabilities set forth above, a barbed tape product
may be formed with trusses added thereto as shown in Figures 3A-5E, which are diagrammatic
sectional views of alternative embodiments for trusses in combination with the coils. These
trusses may be added on to extend generally outside the round area defined by the coil for
strengthening and/or anti roll advantages. The trusses can be used to shape the coil as desired.
Alternatively, the trusses may be positioned mainly or completely inside the coil and still function
for strengthening and/or shaping. Figure 6 is a photograph of a deployed coil that includes the
embodiment generally shown in Figure 3E. As may be appreciated, the exteriorly extending
portion extends the height for greater barrier forming advantages.

When deploying the product, the payout process is accompanied by rotation forces
caused by the torsion that is caused as the product is expanded axially and the product moves
radially from its largest diameter to a smaller diameter. These rotational forces if unresisted
would cause precession of normally axially aligned clips. For example a 60 inch diameter unit
with 9 clips would precess one hour (30 degrees). Longer units will precess further. For
example a five hundred foot unit would have a rotation of twelve hours (360 degrees) when
deployed. In order for external trusses to lie in a relaxed state when the product is deployed,
the truss attachments would have to be placed in a counter rotated configuration. This counter
rotated form would cause the trusses to extend radially outward from the coil along substantially
the entire circumference of a coil and would cause the coil with its trusses to be non-compact.
In order to keep the trusses in three general regions of the coil, the product can be
manufactured with sequential segments of the coil having alternatingly clockwise and counter
clockwise helically progressive configurations. Thus, when deployed, a reference point of
maximum rotation on the first segment will start at twelve o'clock and rotate clockwise to one
o'clock. A reference point of maximum rotation on the next segment will rotate counter
clockwise back to twelve o'clock. With additional segments, the same alternating precession
occurs for a net of zero precession. In this way, the compactness of the product in its non-

deployed state may be maintained. In order to form the coils in clockwise and counterclockwise directions, a table of the bender 90 may be shifted right or left in the bender portion of the system 30.

5 Another advantageous aspect of the trusses is that they form blisters or extensions on an exterior of the coils. These blisters may be formed in compression and/or in tension to provide additional structural strength to the product. This is particularly important with large diameter coils. Such coils need more strengthening, in general, so as not to sag under their own weight, for example. However, the large diameter coils have the advantage of precessing less during deployment. For example, a seventy-two inch diameter coil may be formed of five fifty
10 (50) foot segments for a total of two hundred fifty feet. With no alternation of helical direction, such a coil would precess only four hours (120 degrees). The coil may be formed having any diameter and may be formed of segments that provide for an overall deployment length of four hundred to six hundred feet.

15 barbed tape product that can be easily deployed on the ground by offloading it from a dispenser on a trailer or the like while a towing vehicle pulls the trailer along the course of deployment. The barbed tape product can be easily taken back up onto the dispenser for redeployment elsewhere. The product has internal and/or external trusses to inhibit both deformation and rolling away of the product when it is deployed.

20 For the purpose of deploying and retrieving the coil, a dispenser is shown in Figures 7A-7L.

Figures 8A-8F show an Amaze-N-Tow pallet carrier that is available on the market and which may be adapted to provide the dispenser of Figures 7A-7H.

5 Picture of a dispenser/trailer in accordance with the present invention (1 sheet).

The ease of deployment and retrieval of the barbed tape product may advantageously reduce the required manpower to between one tenth and one hundredth of that required prior to this invention.

(may have additional drawings.)

5 Figure 9A is a perspective view of the attachment element or clip 111. As shown, the clip 111 has a base 330 and a pair of arms 333, 335 extending from a first end 336 of the base and a single arm 339 extending from a second end 340 of the base 330. The clip 111 has a generally U-shaped configuration. This configuration is similar to a staple structure in which the arms 333, 335, and 339 extend transversely away from the base 330 to form the U-shaped
10 configuration.

As shown in Figures 9B and 9C, the clip 111 may be placed in a generally embracing configuration around a pair of product strands 95. The clip 111 is then crimped onto the product strands 95 into an interleaved configuration as shown in Figure 9C. That is, the pair of legs 333 and 335 receive the single leg 339 therebetween. Advantageously, the clip 111 may
15 be provided with slits 342 and 344 that receive respective filaments 336 and 348 therein. Additional details with regard to the slits and filaments will be described below.

Figure 9D is a top plan view of a plurality of clips 111 attaching strands 95 of adjacent loops together. As may be appreciated, Figure 9D is a cut away view showing only one region of attachment points of an overall coil of strand 95. As shown, an attachment point defined by
20 an attachment element or clip 111 is offset relative to attachment points on adjacent pair of strands 95. The exception is in the exemplary view of Figure 9D is the upper two adjacent pairs of strands 95 in which the attachment points are aligned. Figures 9B through 9D effectively show how the system of the present invention accurately places the attachment elements 111 and avoids misclipping including placement of the attachment element or clip 111
25 on a barb, for example. Furthermore, as shown in Figure 9D, placement of an attachment element or clip 111 in surrounding relation to a pair of strands has the advantage of slightly separating the pair of strands from strands adjacent to the pair. Thus, the target for placement of

a subsequently placed clip is enlarged and an open space is provided for arm(s) on one side of the clip 111.

Figure 9E is a top plan view of multiple clips 111 in a string of clips 351. The string of clips 351 is held together by a pair of common filaments 346, 348. These filaments 346 and 348 are disposed in slits 342 and 344 respectively, and are common to all of the clips 111. The filaments 346 and 348 are held in the slits 342 and 344 by a compression fit. As shown in Figures 9D and 9E, this compression fit may be achieved by a crimping action that crimps outer side portions 353 and 355 inwardly to engage and compressively hold the filaments 346, 348 in the slits 342, 344. The filaments 346, 348 may be formed or comprised of a tough nylon material, for example. Thus, the clips 111 are held together by the filaments until they are separated during the manufacturing process.

It is to be noted that the inwardly crimping deformation of the outer sides 353 and 355 of the base 330 may provide a work hardening effect that strengthens these portions and the base 330 overall against subsequent bending. Furthermore, it is to be understood that a punching or stamping process for forming the slits 342 and 344 in the base 330 may also act to strengthen the material of the clips 111 surrounding the slits 342 and 344, by work hardening for example. Thus, the bases 330 of the clips 111 may be strengthened in longitudinally extending regions surrounding each of the slits 342 and 344. These strengthening effects were somewhat contraindicated since removal of material would typically be associated with a weakening of the region from which the material is removed.

Figure 9F is a side view of the string of clips 351. As shown in Figure 9F, the arms on opposite ends of the base 330 extend generally parallel to each other away from the base 330. The length dimension of the base 330 thus corresponds to a distance at which the arms at opposite ends of the clips 111 are spaced. This dimension 358 may be _____ +/- _____, _____ +/-, or _____ +/- _____. These dimensions are larger than those of clips available on the market at the time of this invention. In addition to the advantageous work hardening effect provided in the bases 330, it is to be understood that the bases have a generally rounded peak as opposed to a more flattened

configuration in the clips of the past. This rounded peak configuration of the base has the advantages of _____.

5 While the invention has been set forth above in terms of the exemplary embodiments shown in the Figures, it is to be understood that many variations are possible without departing from the spirit and scope of the present invention. For example, it is to be understood that the slits 342 and 344 could be placed in the bases 330 at an orientation rotated by 90 degrees. Thus, the lengths of the slits 342 and 344 would extend in side to side directions as opposed to length directions with respect to the bases 330. The materials utilized for the product and the attachment elements may be varied without departing from the spirit and scope of the invention. 10 For example, the material for filaments 346 and 348 may be selectively varied. Configurations of the attachment elements may be changed without departing from the spirit and scope of the invention. It is to be understood that any attachment element could be used in place of clips 111 shown and described above. Furthermore, the concepts of the present invention could be applied in other applications. For example, a predetermined pattern of attachment points could 15 be applied in making bed springs.

Thus, it can be seen that the present product could be provided in alternative forms. For example, a barbed tape product may be formed of a tape without the reinforcing wire shown and described with regard to Figure 1. In such cases, providing attachment points in accordance with the details above can still be advantageously implemented.

20 The embodiments and examples set forth herein were presented in order to best explain the present invention and its practical application and to thereby enable those of ordinary skill in the art to make and use the invention. However, those of ordinary skill in the art will recognize that the foregoing description and examples have been presented for the purposes of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the 25 invention to the precise form disclosed. Many modifications and variations are possible in light of the teachings above without departing from the spirit and scope of the forthcoming claims.

Applications for such a barbed tape products are endless. However, in an age when mankind no longer wishes to put up with the horrors of land minds, the capability of configuring barbed tape products in accordance with the present invention may prove to be a highly desirable alternative for selectively protecting large or small areas in a customizable fashion in which the product itself is a deterrent from entry into the area. Unlike land minds, the product of the present invention can advantageously be seen and avoided. On the other hand, the barbed tape products of the present invention can be configured to slow or stop the progress of any person entering an area secured therewith.

The embodiments and examples set forth herein were presented in order to best explain the present invention and its practical application and to thereby enable those of ordinary skill in the art to make and use the invention. However, those of ordinary skill in the art will recognize that the foregoing description and examples have been presented for the purposes of illustration and example only. The description as set forth is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the teachings above without departing from the spirit and scope of the forthcoming claims. For example, an inner coil may be suspended and supported by trusses within an outer coil.

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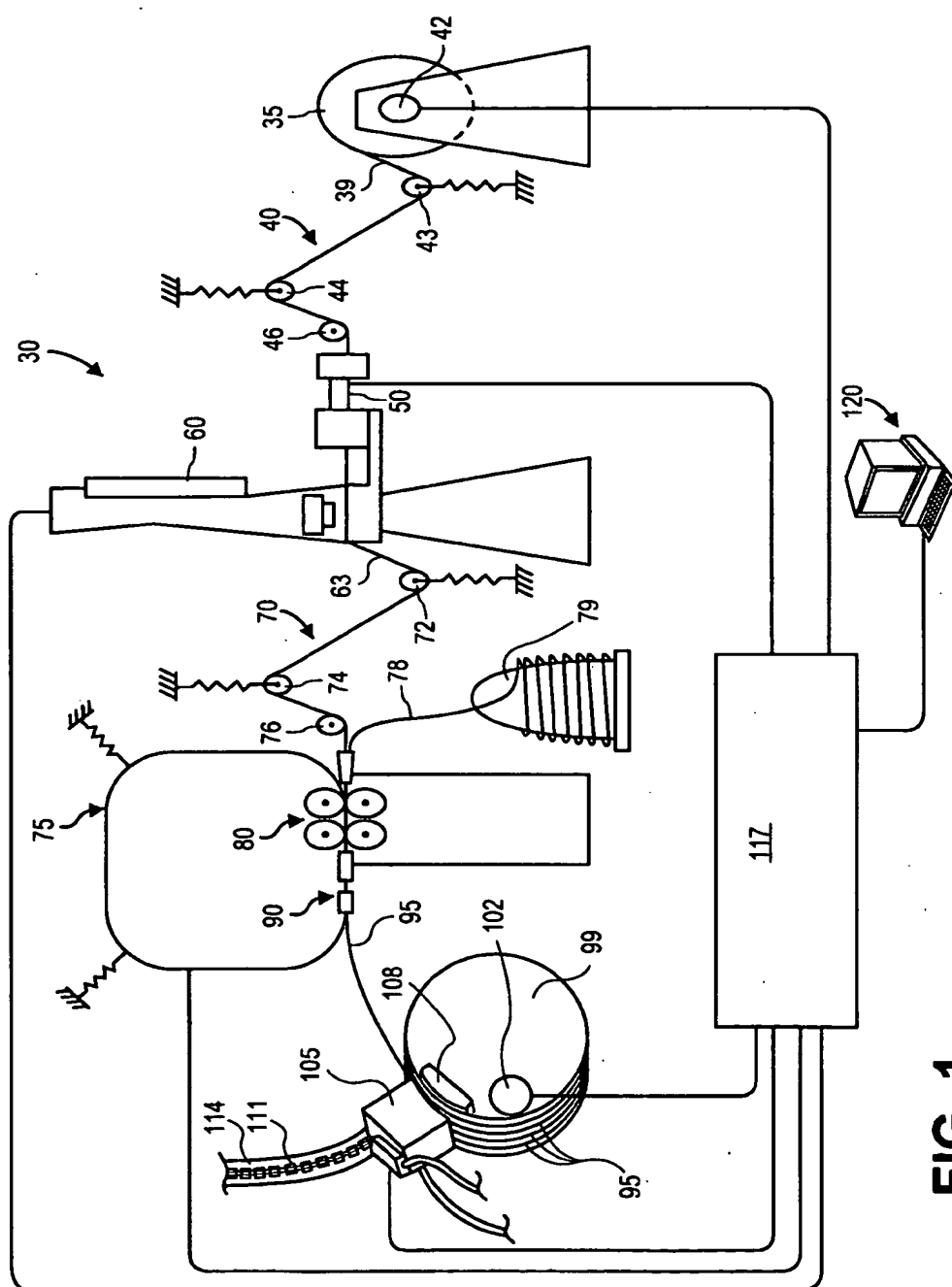
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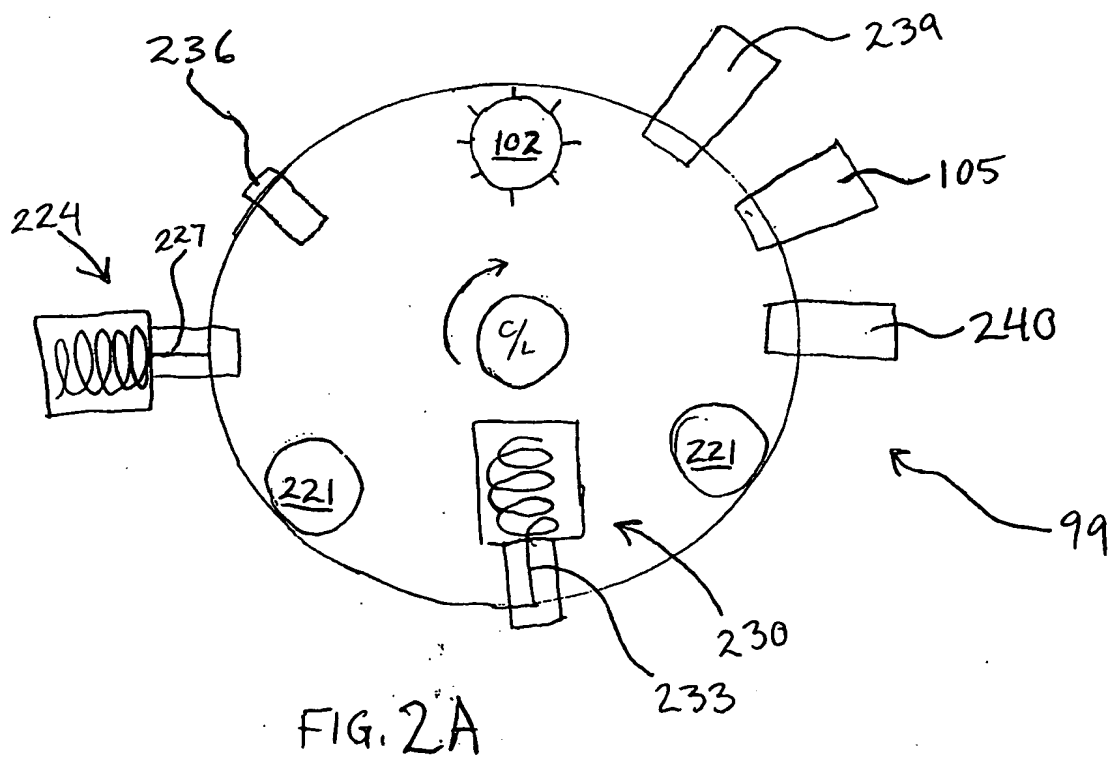
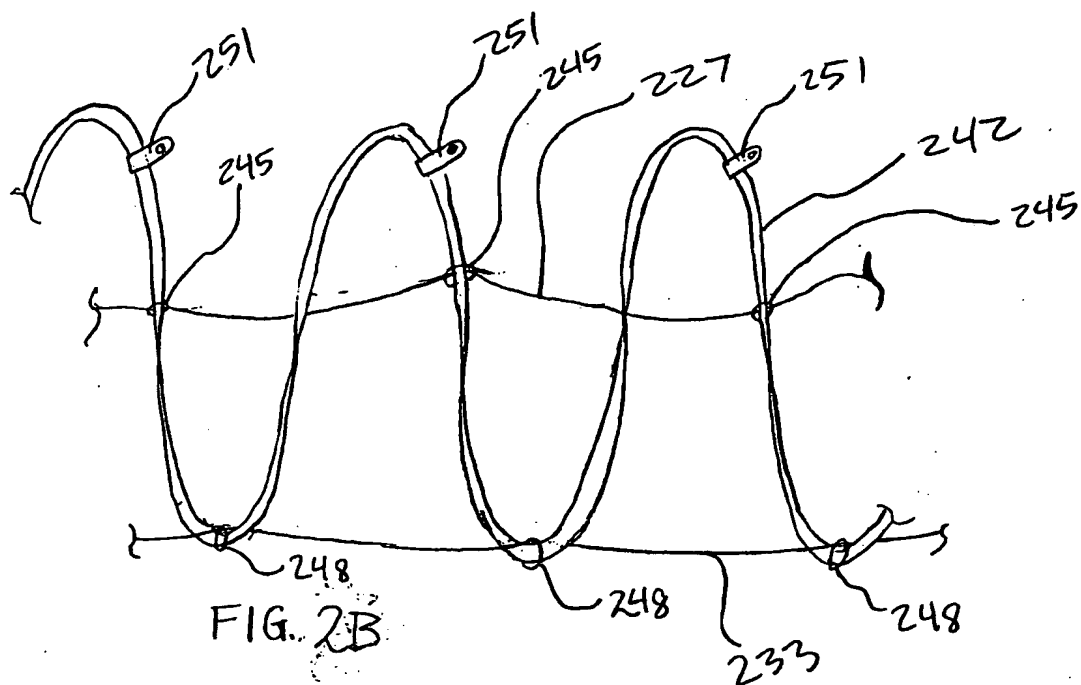
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Various Configurations of Internal / External Trusses

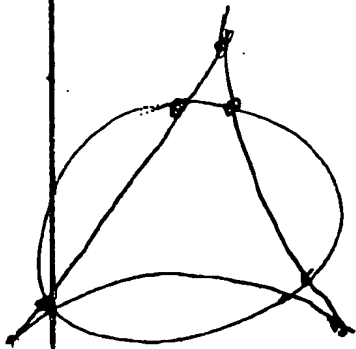
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FIG. 3A

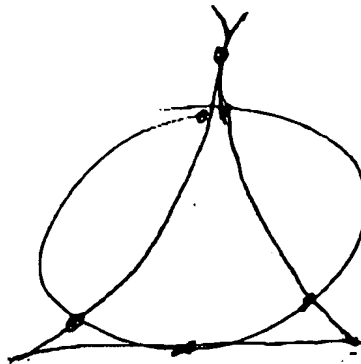


FIG. 3B

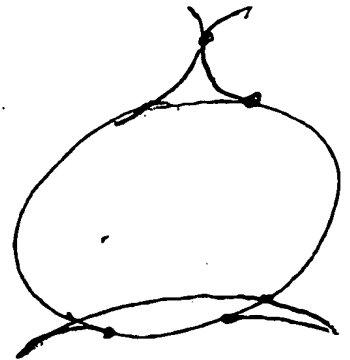


FIG. 3C

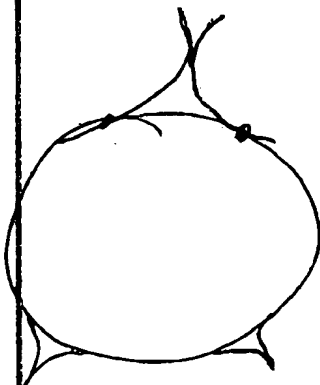


FIG. 3D

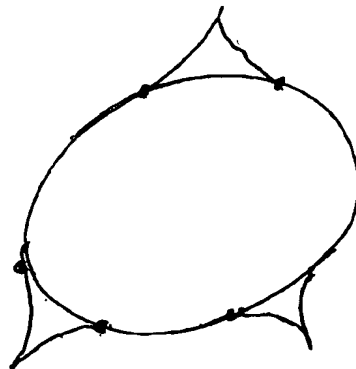


FIG. 3E

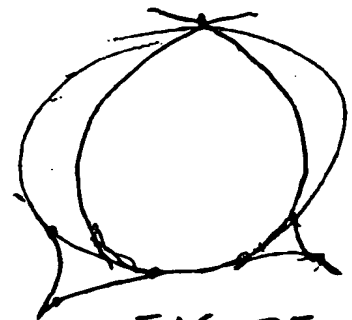


FIG. 3F

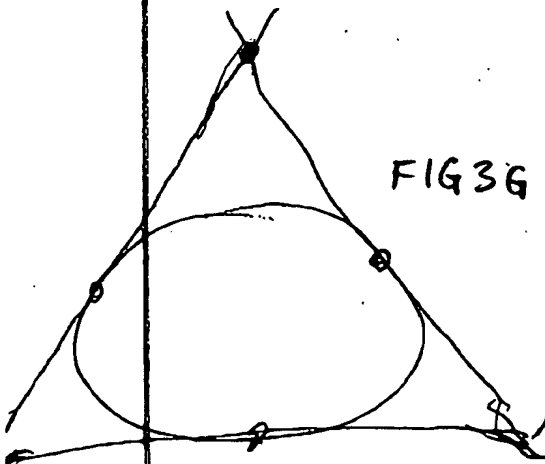


FIG. 3G

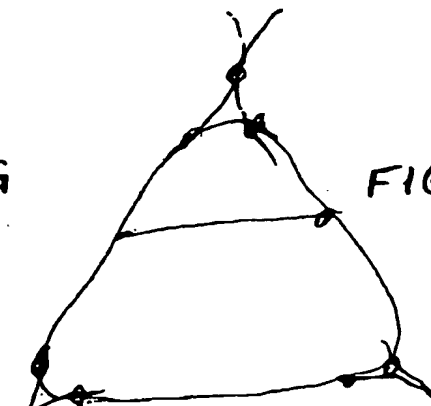


FIG. 3H

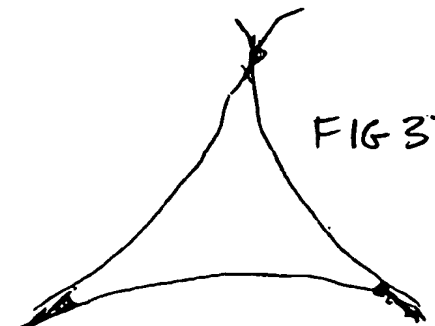
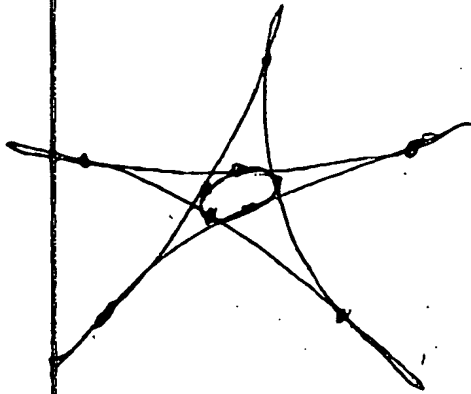


FIG. 3I

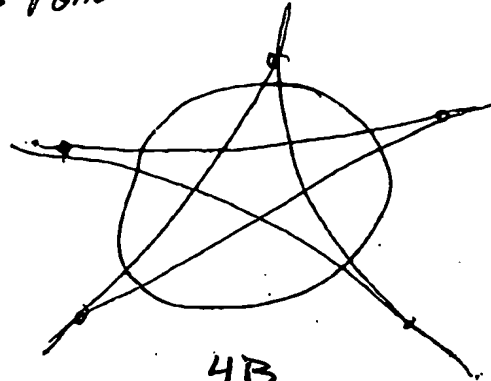
6/14/04

Various Configurations of Internal / External Trusses

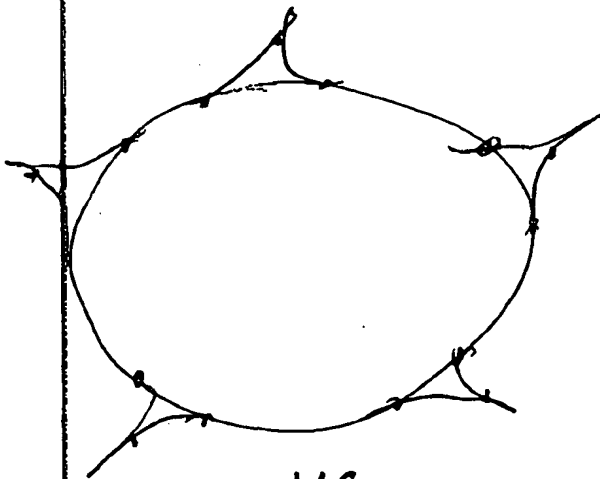
5 Point



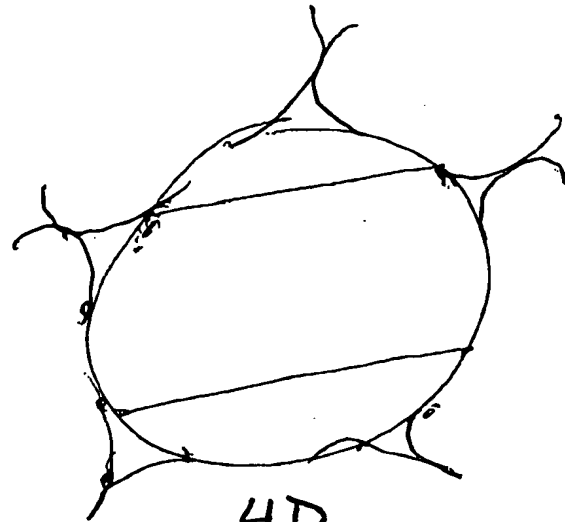
4A



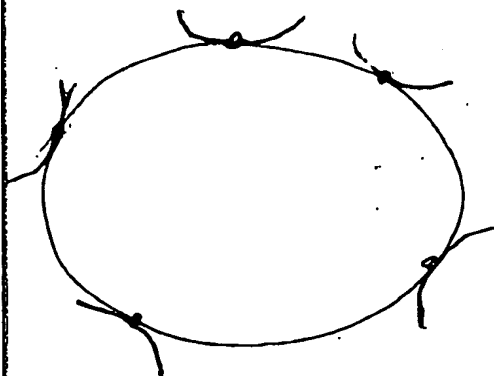
4B



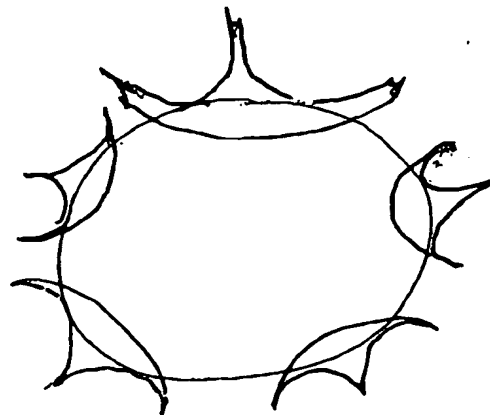
4C



4D



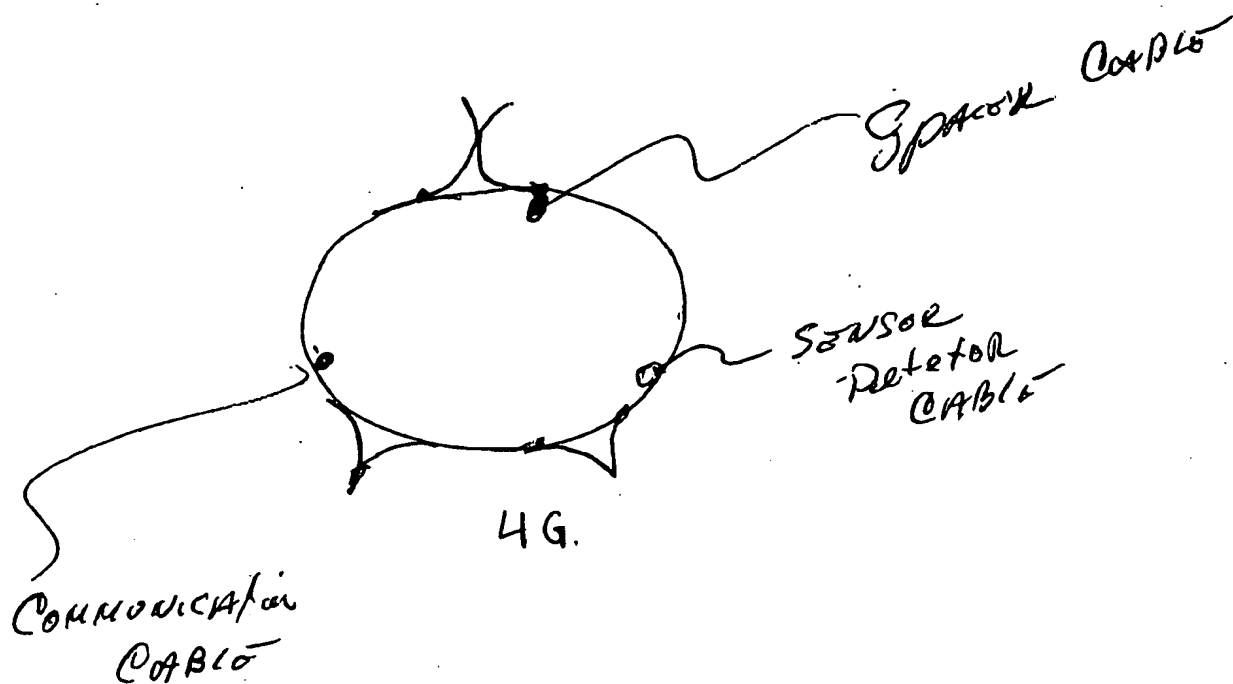
4E



4F

6/14/04

Various Configurations of Internal / External Trusses

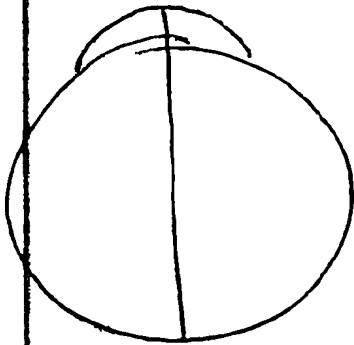


DAVE HARTY

7/11/04

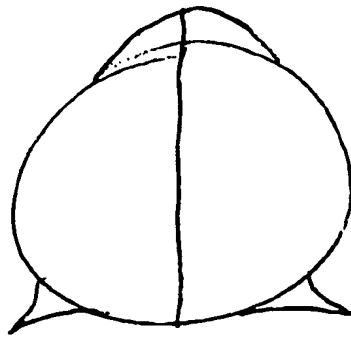
The Catfish Deployment

(A)



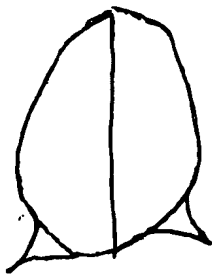
5A

(B)



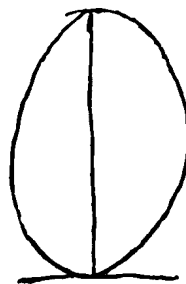
5B

(C)



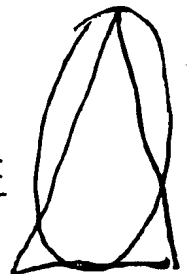
5C

(D)



5D

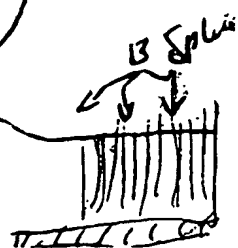
(E)



5E

Δ or \perp Post/BRACE
every 50'

We can splice CW 33 coil loop to CCW 33 coil loop
seamlessly to make 650' unit (Deployment)
with 13 CW + 12 CCW. Sub coil



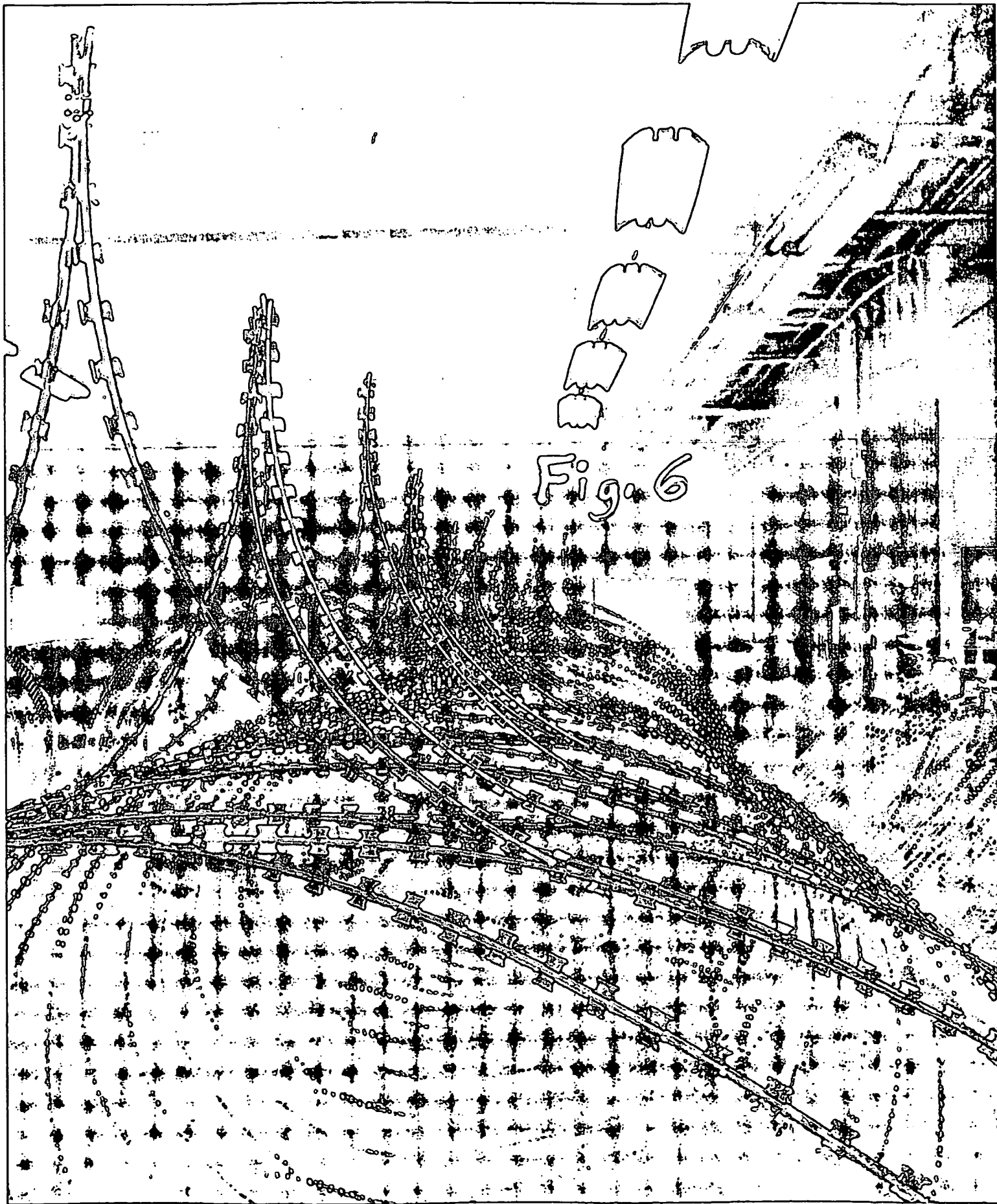


Fig. 6

COBRA DISPENSER (MAGAZINE) (280' x 554' BTC Rapid BARRIER Dispenser)

MIL

Scut = 45' (40) = 220'
4' x 10' 62" BASE @ 18"

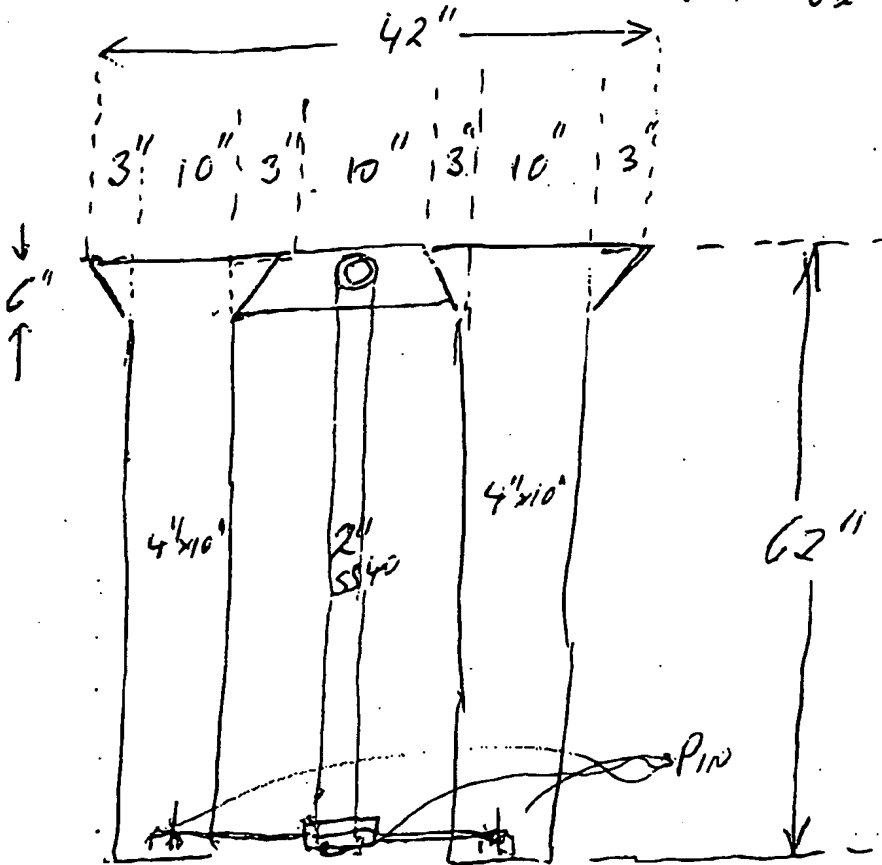
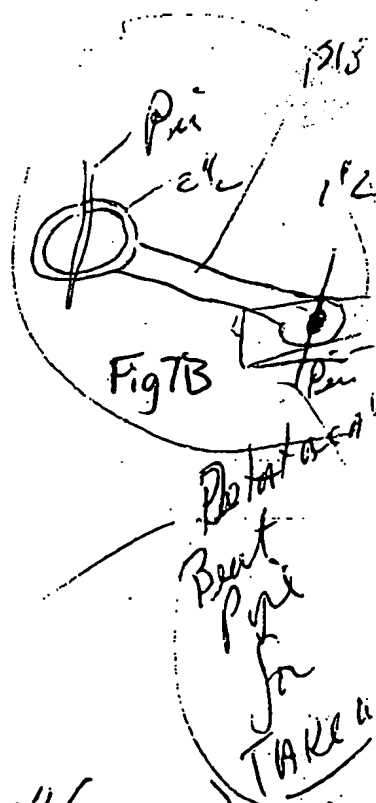


Fig. 7A



Detachable
Bent
Pin
for
TAKER

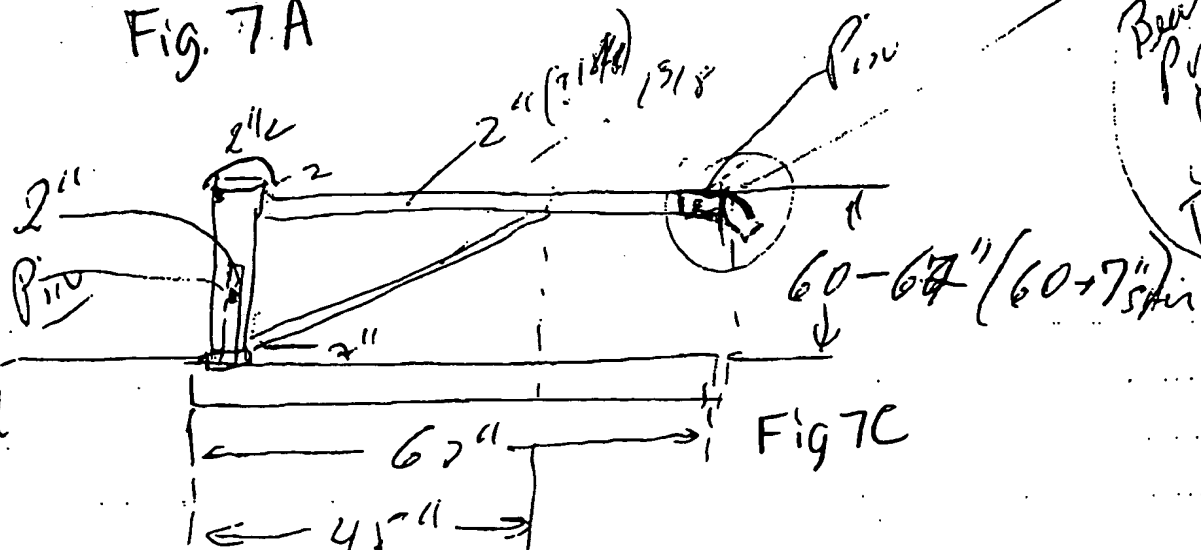


Fig. 7C

Optical
7" SHH

8/17/04

MAGAZINE

FORKS

Fig 7D

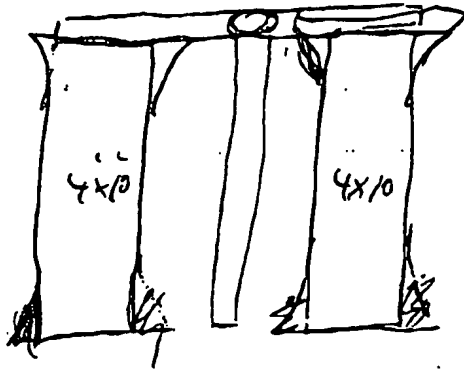
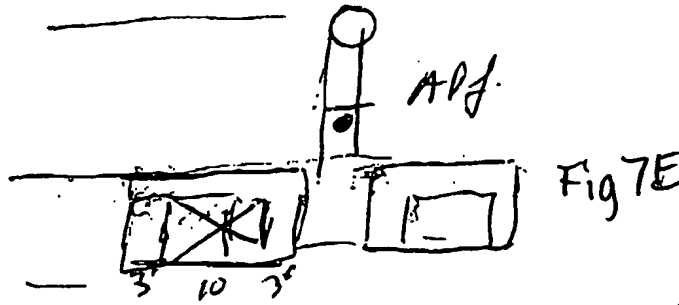
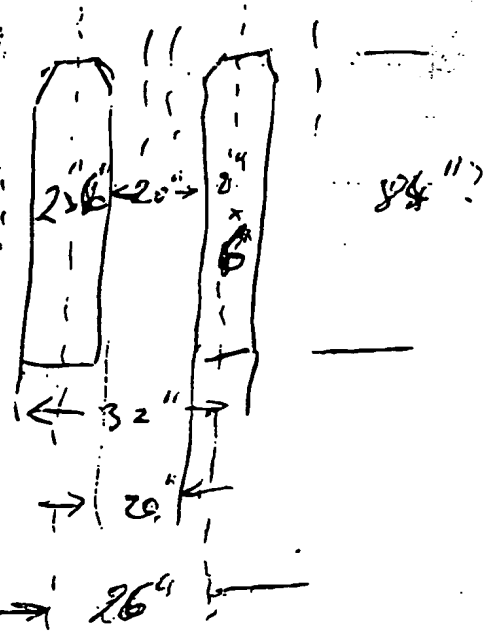


Fig 7F



ASCA

Recovery

60 20 60
APJ

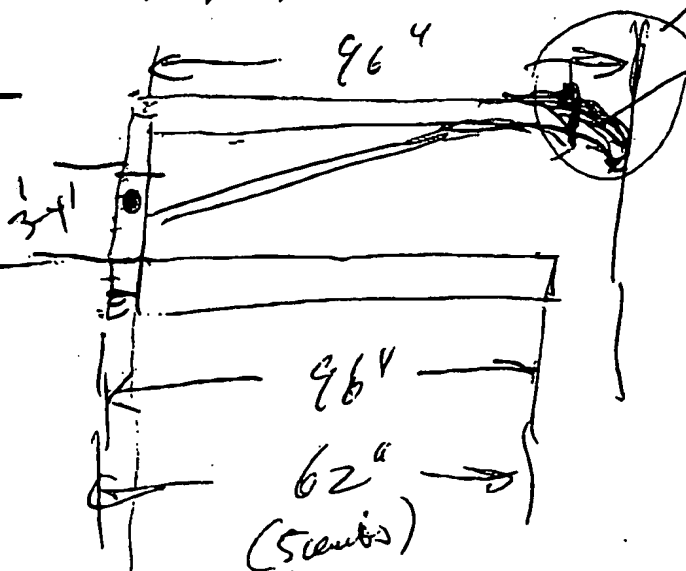


Fig 7G

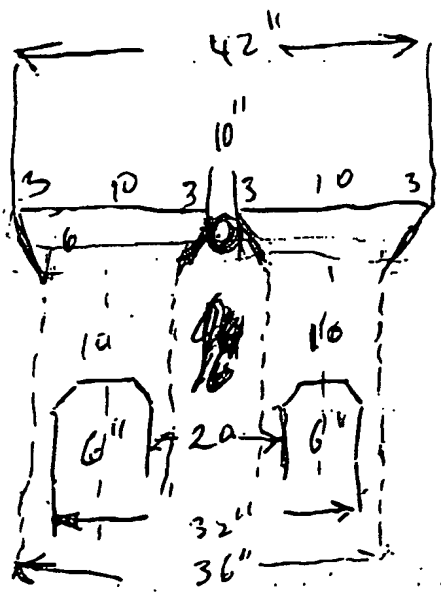
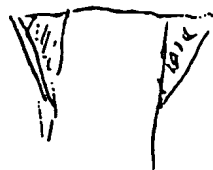
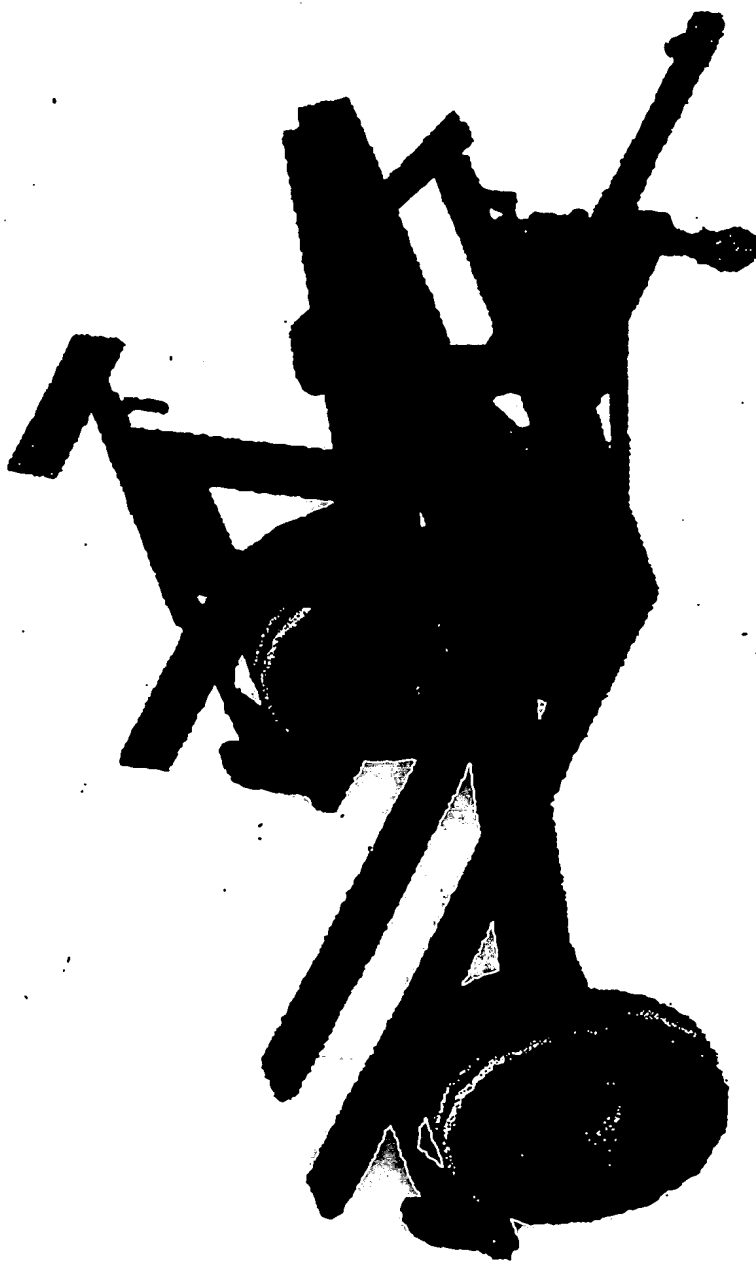


Fig 7H

6/17/04

U ART 3



7I
~~Fig 88~~

Fig DROP

AVAILABILITY

4632 103" L x 83" W x 7' H

108" L x 88" W

Fig. 8A



ANT 1

THE ANT AMAZE-N-TOW PALLET CARRIER

U.S. PATENT
5,594,639

- Like its namesake of the insect world, the ANT can pick up and carry loads several times its own weight!
- The ANT allows any vehicle with a conventional ball or military hitch to haul and unload heavy loads simply, quickly and safely!
- The ANT combines the lifting power and material handling flexibility of a fork lift and the highway-speed transportation capacity of a larger truck!
- The ANT is incredibly strong: carrying loads of up to 4,500 pounds!

This 30 second video clip is from our promo video, contact us for full length version.

With the ANT, you can haul 2,500 to 4,500 pounds with your car or pickup with a standard ball or military hitch!



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Columbus, Georgia 31908
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1-334-732-0888
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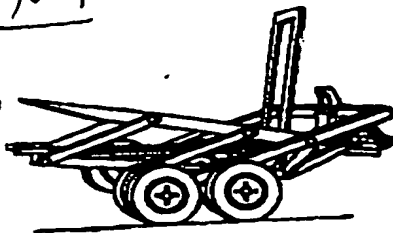
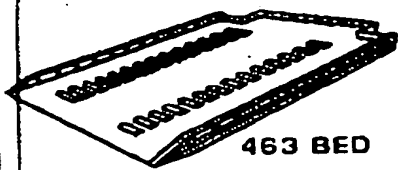


We Accept Visa and Mastercard



[request additional information](#) [lease application](#)

ANT 2



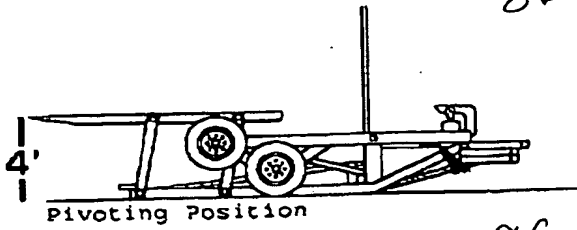
PUMP	12 volt hydraulic
TIRES	LT225-R16
SPINDLE	6,000 pounds each
LIGHTS	sealed

30'6"

0'6"

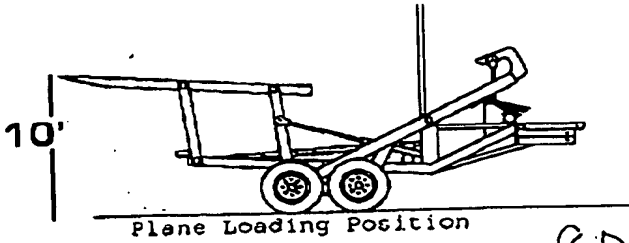
Ground Load Position

8B



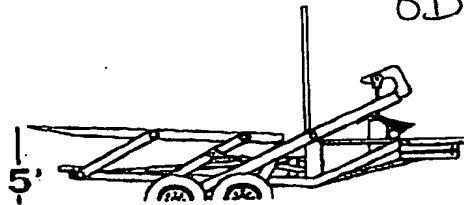
Pivoting Position

8C



Plane Loading Position

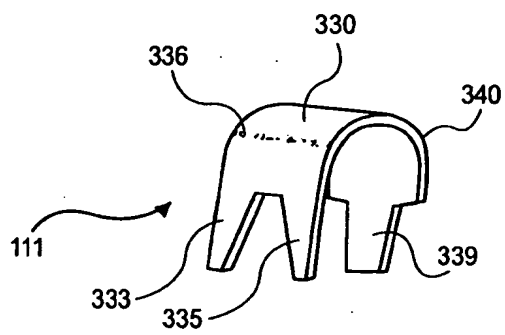
8D



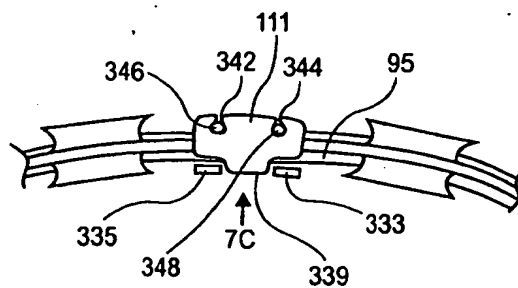
<http://amaze-n-tow.com/ant463.htm>

Fig 8E

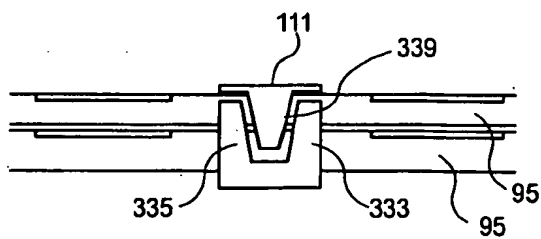
1/23/2004



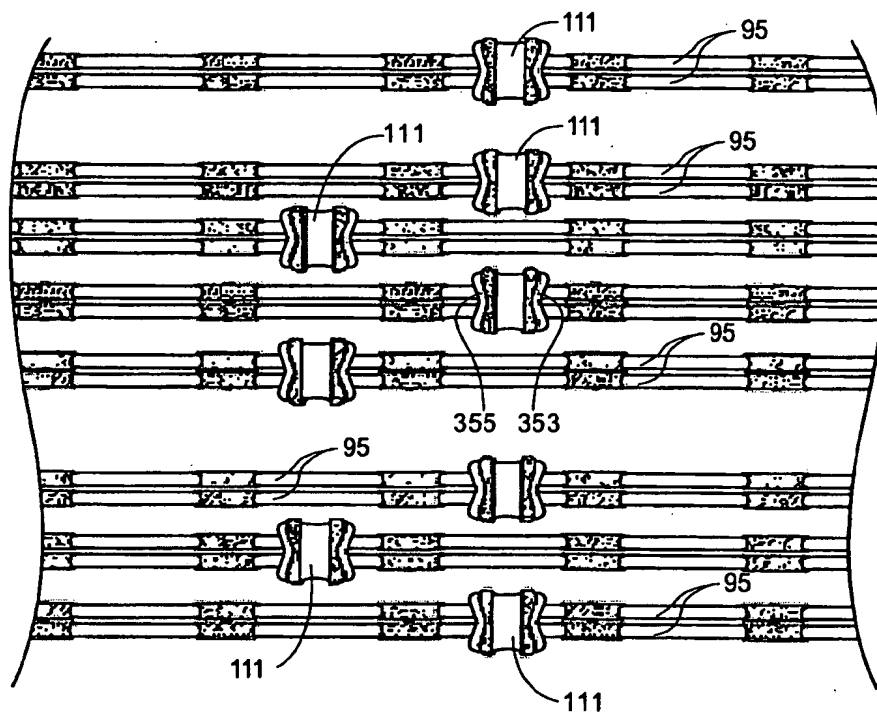
9
FIG. 7A



9
FIG. 7B



9
FIG. 7C



9
FIG. 7D

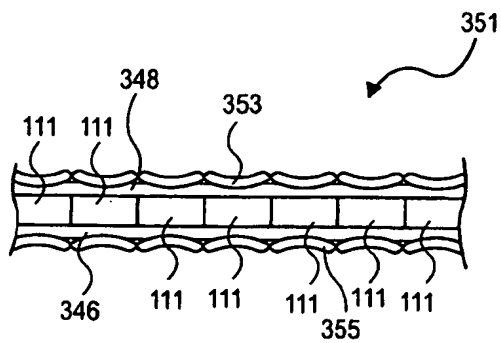


FIG. 9E

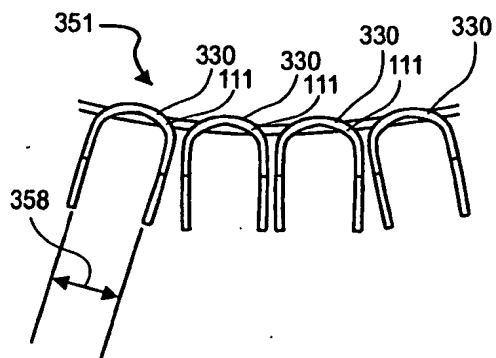


FIG. 9F